Poverty's Remains

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Pieter van Miereveld, Doctor W. Van der Meer's Anatomy Lesson in Delft, 1617;

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When the aliens finally visit earth and want to understand human behavior, the first thing they are going to have to sort out is this obsession we have with death. So much of our time is spent simultaneously denying and mourning our evanescent nature, a habit that manifests itself as a profound queasiness whenever we think of ourselves as flesh-and-blood. When I teach neuroanatomy and handle a human brain, pointing out some pathway to students, I never fail to get the willies that the same pathways lie inside my own head. Or try this: the next time a loved one tenderly brushes a hand against your

cheek, remember that someday, that cheekbone will be no more than a zygomatic arch in a skull. Or when you're lying in bed tonight, listening to your heart beat, tell yourself, You know, that heart won't beat forever—and just wait for the cold sweat to break out.

Such queasiness about one's own flesh projects well into the indefinite future, when, surely, one's body will no longer be living. By all logic, once the battle has been lost, once the inconceivable has actually

come to pass, the fate of one's carcass should cease to matter. In 1829, taking such thinking to the extreme, a radical British pamphleteer named Peter Baume left explicit instructions for his body's disposal: his skeleton was to be donated for medical education, or, failing that, his skull left to the phrenological society and his bones made into knife handles and buttons; his skin was to be tanned to make a chair cover, and his soft body parts used as fertilizer for roses.

But most of us don't assume such a pragmatic attitude. We are haunted by thoughts of negligent groundskeepers at cemeteries or, more, by the specter that one day our own burial ground will be paved over for a parking lot. Our graves must be kept clean, our bodies left intact and treated with respect. Armies in the midst of perfect savagery will halt to exchange their dead. In certain religious orthodoxies, body parts removed over the course of a lifetime—teeth, tonsils, a gallbladder—are saved for future burial with the rest of their owner. The mistreatment of the dead can bring outrage, as indigenous populations throughout the world confront anthropology museums and collections and demand the return of the bones of their ancestors. And some extraordinarily poignant moments derive from this concern as well. The thought of a Neanderthal placing flowers around the body of a loved one is tearfully moving; the hand that clutched those flowers may have been less deft than our own, but in that ancient act of grieving we feel the shock of kinship and familiarity.

Such feelings are irrational. What does it matter once we are dead? I have made postmortem arrangements that reflect my belief in the importance of science. Nevertheless, it still unnerves me to think of some callow first-year medical student joking about the appearance of my future, dissected self, or when picturing my beloved spleen

pickled in a jar in a dusty corner of some lab.

Who needs that? Few of us, surely; unfortunately, such reticence has traditionally led to a dearth of what anatomists call human biological material. Medical students must learn anatomy; investigators must collect data if they are to distinguish the normal from the diseased; autopsies must be performed so physicians can see what went wrong and thus enable the living to live longer. But necessary as such procedures are, they are not a pleasing prospect. Most people are unwilling to donate their bodies, or their organs, to science, and physicians dread having to persuade next of kin to permit an autopsy.

Consequently, a disproportionately large fraction of the cadavers used for instruction and research is made available by indigent individuals. Because they cannot afford private physicians, many poor people end their days in large urban teaching hospitals, where they are studied in sickness and in death by medical students and interns. But the socioeconomically disadvantaged generally die in ways different from those of wealthier people, ways that can alter the size and appearance of their internal organs. As a result anatomists and medical students, working with this limited and biased range of material, have acquired a skewed notion of what a "normal" human body looks like.

The overreliance on the poor for autopsy material dates at least as far back as the sixteenth century, when King Henry VIII decreed that the bodies of executed prisoners be turned over to the anatomists for dissection. The decree was made more for conspicuous punishment than out of a fondness for science; the name of the cadaver was to be published, the dissection performed publicly, and the remainders tossed to animals. Given the draconian nature of justice of the time—stealing a piece of bread could be a capital crime—it was by and large the poor who wound up on the dissectors' slabs. Medical schools were growing in size and number, however, and with them the need for anatomical research and training; even the enthusiasm for public hangings could not match the demand for cadavers. In the late eighteenth century a new career opportunity was born, the body snatcher. "Resurrectionists" spent moonless nights digging up fresh bodies or they might raid a funeral en masse and wrest the deceased from horrified relatives. Those less inclined to such taxing

manual labor might simply bribe the orderly at a hospital death room or pretend to be a relative in order to claim the body.

Again it was overwhelmingly the poor who were purloined. Funerals for the wealthy were guarded; those of the poor were easily raided. The indigent deceased might lie vulnerable in a hospital for days while the family (if one existed) tried to scrape together the funds to pay the hospital and claim the corpse. And the bodies of the poor were buried, at best, in flimsy coffins or, more often, laid coffinless in shallow mass graves or paupers' fields—easy picking for the resurrectionists. The wealthy, in contrast, were buried in sturdy triple caskets. Burial options multiplied as anxiety about body snatching spread: the so-called Patent Coffin of 1818 was explicitly and expensively marketed as being resurrectionist-proof. Cemeteries began offering a turn in the Dead House, where, for a fee, the closely guarded corpse would genteelly putrefy past the point of interest to dissectors, at which time it could be safely buried.

Meanwhile, the fears of the poor continued to mount, thanks in no small part to the appearance of a new verb in the lexicon: "burking," named for William Burke, the aging resurrectionist who pioneered the charming practice of luring beggars into his home for a charitable meal, then strangling them for a quick sell to the anatomists.3 Although such indiscretions were generally overlooked by the august and compliant medical community, in the poor they induced a riotous displeasure. Frenzied crowds lynched captured resurrectionists, attacked the homes of anatomists, and burned hospitals. In New York City, shortly after the American Revolution, medical students from King's College (now Columbia University) were discovered digging for bodies in a paupers' graveyard (no doubt trying to cut the resurrectionists out as the middlemen and get some pocket money for themselves). The ensuing riot, known as the Doctor's Rebellion, lasted for days, forcing physicians to take shelter in the home of Alexander Hamilton while the state militia fired on the crowd.

In the eighteenth and nineteenth centuries many European governments took steps to control such mayhem and regulate the predation upon the poor. Anatomists were supplied with material, those unseemly burkers and grave robbers put out of business,

and the poor kept in line, all with one handy new law: anyone who died destitute in a poorhouse or a paupers' hospital would be turned over to dissectors.

The historian Ruth Richardson, author of Death, Dissection and the Destitute, argues that the laws were designed to punish and terrorize the poor. Richardson points out that when the so-called Anatomy Act was first introduced in the British Parliament in 1829, it was soundly rejected as brutal and unfair. Yet just three years later, shortly after the Reform Riots instigated by the lower class, the act was reintroduced into the same Parliament and quickly passed by a vote of forty-six to four.

The Anatomy Act thus served to formalize the anatomists' overreliance on the corpses of the poor. In the century following the English enactment, for instance, more than 99 percent of the cadavers used in London for medical education came from poorhouses. Although the percentage has dropped in recent years, as more and more people voluntarily donate their bodies to research, it is still overwhelmingly the poor whose bodies provide the training base for physicians and scientists. I once spoke with an anthropologist who worked for one of the biological supply houses that sell skeletons and body parts to the medical community: His job was to comb rural India and buy skeletons from the poor relatives of the deceased. He never had trouble finding willing vendors.4

None of this should surprise. Socioeconomic inequity permeates every aspect of the health care system in the United States. A study conducted in early 1990 by Colin W. McCord and Harold P. Freeman, two surgeons at Harlem Hospital in New York, showed that African-American men in Harlem have a shorter life expectancy than men in Bangladesh. Other classic studies have demonstrated that in an ambulance trip to an emergency room, the poorer you appear to be, the more likely it is that you will be pronounced dead on arrival.

But poverty has a profound and even more direct influence on health. The ailments to which disadvantaged people typically succumb are quite unlike the ones that end the lives of the wealthy: chronic malnutrition, parasitic infections, lingering tuberculosis, wasting illnesses—in essence, diseases involving prolonged stress. Moreover, chronic stress induces numerous morphological changes in the

body that can affect what is observed during autopsy.

Consider the adrenal gland. When the owner of the organ is in a fight-or-flight state, the adrenal gland secretes adrenaline and a class of steroids known as glucocorticoids, which speed up the heart rate and the metabolism. People who live in chronically stressful conditions place a constant demand on their adrenal glands to produce the hormones, and the glands may grow larger in compensation. Laboratory rats suffering from a chronic wasting disease display, at autopsy, adrenal glands larger than those of healthy control rats. Human cadavers show the same effect.

But medical scientists before the 1930s did not know this fact. Physicians, examining cadavers predominantly of the poor, thought they were learning what a normal adrenal gland looks like; instead, and unknowingly, they were observing the physiological effects of a lifetime of poverty. On the infrequent occasion when the body of someone with a higher income was examined, it was noted that the adrenal glands seemed oddly undersized sized—lighter in average weight than the ones mentioned in pathology journals and not at all like the ones observed in medical school.

Unfamiliar with the appearance of a normal adrenal gland, physicians invented a new disease to explain their discovery: idiopathic adrenal atrophy, which is a fancy way of saying that the adrenals had shrunk for some unknown reason. This “disease” flourished in the early twentieth century; then physicians caught on, and then, voilà, everyone was instantly cured of the malady.

The overreliance on anatomical material from the poor has led to other medical mishaps that are not so humorous. On at least one occasion, the distorted data base has had tragic consequences.

When a person is in a state of stress, the hormones secreted by the adrenal glands suppress the immune response. The chronic stress experienced by poverty-stricken people eventually can cause glands essential to the immune system, such as the thymus, located in the throat, to shrivel away to virtually nothing. As a result a disproportionately large amount of autopsy material—derived as it is from people with diseases caused by chronic stress and deprivation—included atrophied thymus glands. Thus

what was regarded in the 1930s as a normal-sized thymus was

actually a greatly shrunken one. The stage was set for a horrendous medical blunder.

For some time pediatricians had identified a relatively new disorder known colloquially as crib death and now called sudden infant death syndrome. Seemingly at random, parents who tucked their healthy infant into bed for a peaceful night's sleep would return in the morning to discover the infant had died. Modern medical scientists have made some progress in understanding SIDS: the disorder seems to occur in infants who in their third trimester as a fetus suffer an oxygen deficiency that damages the brain cells responsible for controlling respiration. At the time, however, physicians had no insight at all into the cause of the mysterious deaths.

Faced with this enigma, a pathologist named Paltauf, working at the end of the nineteenth century, adopted a logical course of research: He carefully autopsied SIDS infants and compared the results with autopsies of non-SIDS infants. Not surprisingly, Paltauf quickly spotted a whopper of a difference: The thymus glands of SIDS infants were far larger than those of the non-SIDS infants. It is perfectlyobvious today what was occurring. The latter group, of course, had died of chronic, stressful illnesses that caused thymic atrophy, whereas the former had died suddenly. In examining the SIDS infants, Paltauf was the first pathologist to be systematically observing normal-sized thymuses.

But he had no way of knowing this, and Paltauf framed a hypothesis for the cause of SIDS that got normal and abnormal confused. In some infants, it seemed to him, the thymus was so abnormally enlarged that during sleep it pressed down on the trachea, suffocating the infant. By the turn of the century this disorder had a name, status thymicolymphaticus, and by the 1920s all the leading pediatric textbooks were offering the same advice: To prevent SIDS, infants' throats should be irradiated to shrink the menacing thymus. The treatment became a pediatric fad, persisting well into the 1950s. Irradiation of the thymus, of course, had no effect on the rate of SIDS. But next to the thymus, and equally exposed to radiation, was the thyroid gland, which helps control growth and metabolism. The spurious cure for this spurious disease eventually led to tens of thousands of cases of thyroid cancer. It is a chilling experience to wander the dusty lower floor

of a medical library, reading forgotten seventy-year-old pediatric texts with their dry discussions of status ***thymicolymphaticus***. The technical details of the disorder, the plausible etiology, the photographs of the "enlarged" thymuses, the confident recommendation for treatment—all wrong, page after page.5 What mistakes are we making now, in our modern scientific ignorance, and how many people will ultimately pay for it?

I won't climb up on my soapbox and preach about a world in which infants get small thymuses because they were born poor. Instead, I'll aim for something a bit more manageable. For starters, this piece of medical history teaches us something about the science we should be carrying out. We currently expend a great deal of effort on some amazing facets of medical research—sequencing the human genome, transplanting neurons, building artificial organs. This is great, but we still need smart people to study some moronically simple questions, like "How big is a normal thymus?" Because those questions often aren't all that simple. Maybe another lesson is that big confounds can come from subtle small places, a dictum understood by the best of public health researchers. It strikes me, however, that the most important lesson is one that transcends science and is relevant to our society at large, a society that can be immensely judgmental: Be really certain before you ever pronounce something to be the norm, because at that instant, you have now made it supremely difficult to ever again look at an exception to that supposed norm and to see it objectively.

FURTHER READING

The original observation of "enlarged" thymuses in SIDS infants was reported by A. Paltauf, "Plotzlicher Thymus Tod, Wiener klin," Woeschesucher (Berlin), nos. 46 and 9. The supposed disease was named a few years later in T. Escherich, "***Status thymico-lymphaticus***, Berlin klin," Woeschesucher, no. 29. An example of the typical 1920s textbook giving advice on preventing the disease with throat irradiation would be W. Lucas, Modern Practise of Pediatrics (New York: Macmillan, 1927); this is the text that contained the information on the personality profiles of infants with status thymicolymphaticus.

Lost amid this consensus of the savants was a 1927 study by E. Boyd ("Growth of the Thymus, Its Relation to Status Thymicolymphaticus and Thymic Symptoms," American Journal of

Diseases of Children 33: 867), which should have put the whole thing to rest. Boyd showed for the first time that a stressor (malnutrition, in this case) caused thymic shrinking. She demonstratedmoreover, that children who died in accidents turned out, upon autopsy, to be "suffering" from status thymicolymphaticus, and suggested for the first time that the whole thing might be an artifact. By the mid-1930s, the first studies had been conducted showing that an array of physical or psychological stressors would shrink the thymus, but it was not until 1945 that a leading textbook in the field emphatically stated that the disease was an artifact and that its treatment was a disaster: W. Nelson, Nelson's Textbook of Pediatrics, 4th ed. (Philadelphia: Saunders, 1945). And despite this information, the practice continued widely well into the 1950s.

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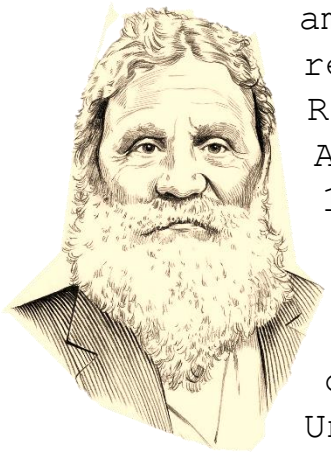
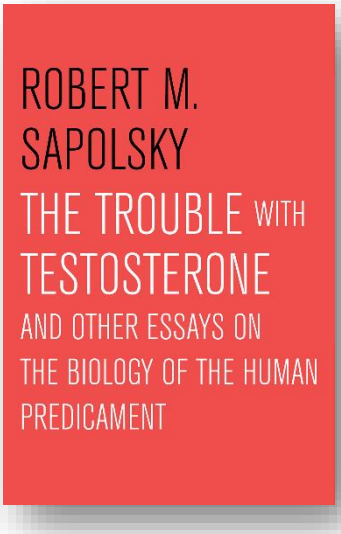
Ruth Richardson's work can be found in her book Death, Dissection and the Destitute (London: Routledge and Kegan Paul, 1987). The relevance of socioeconomic status to the likelihood of your being revived during an ambulance ride is discussed in D. Sudnow, Passing On: The Social Organization of Dying (Englewood Cliffs, N.J.: Prentice-Hall, 1967). The finding of a shorter life expectancy among African-American men in Harlem than among men in Bangladesh is reported in C. McCord, "Poverty, Race, Racism, and Survival," Annals of Epidemiology 3 (1993): 145.





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